Targeted Multidrug Resistant Organisms in Michigan

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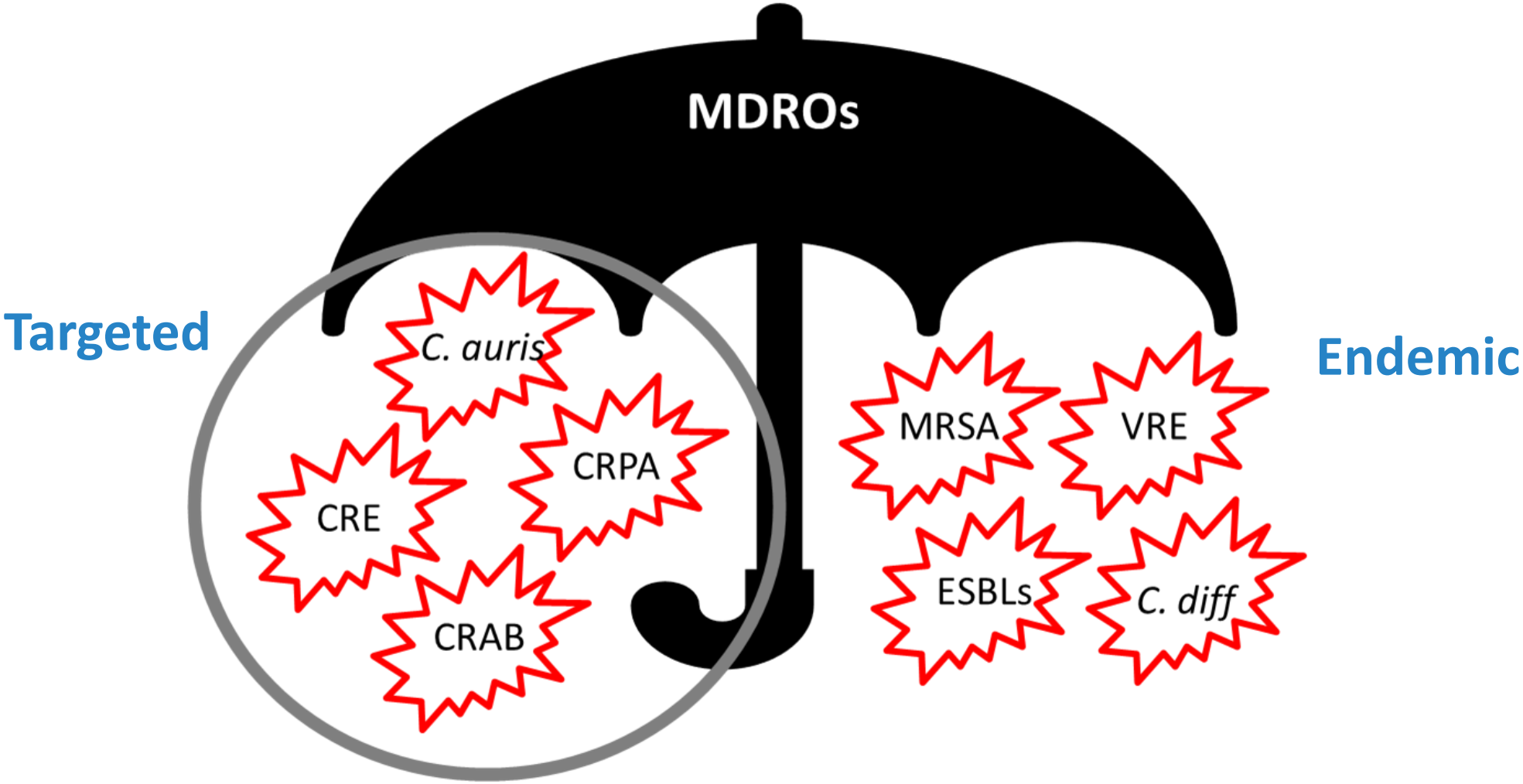
Multidrug-Resistant Organisms

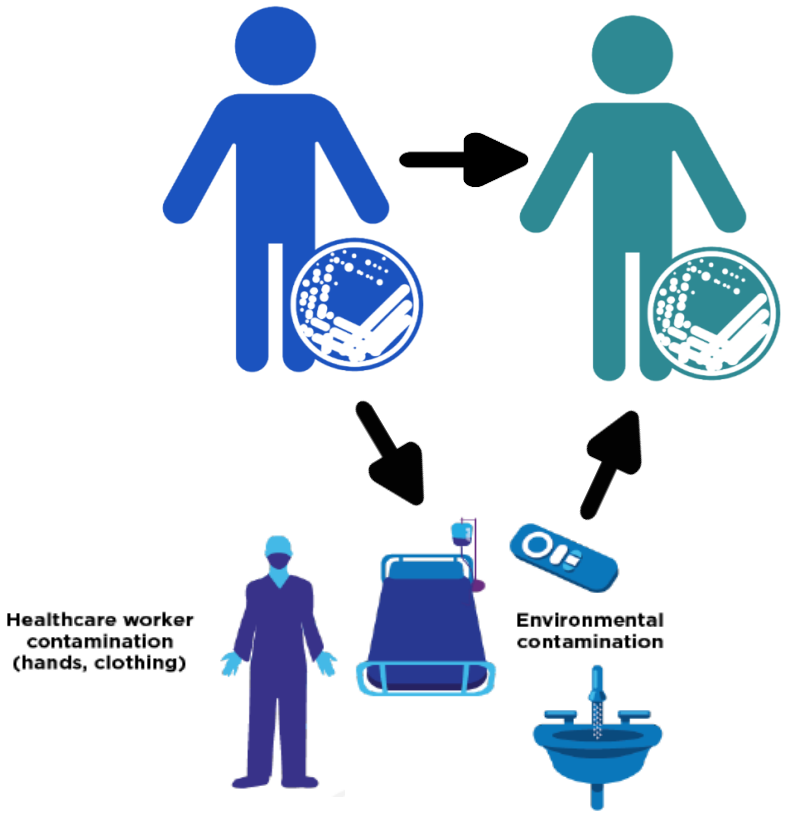


Targeted Multidrug-Resistant Organisms

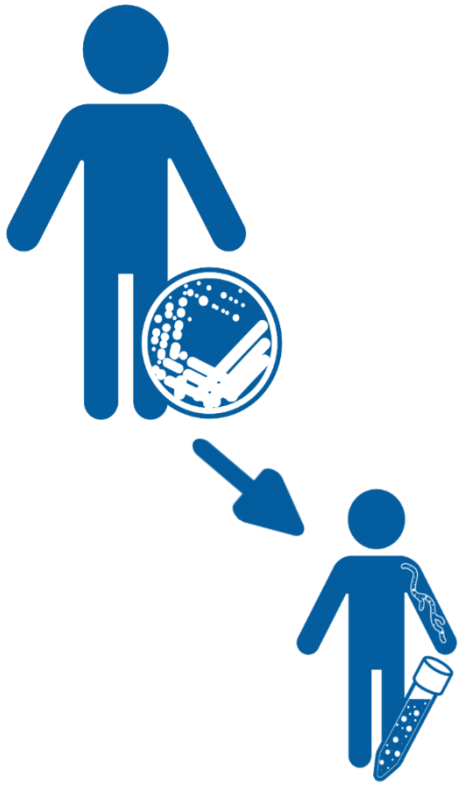
What do they have in common?

- Opportunistic pathogens that can **colonize** multiple mucosal and/or skin surfaces
- Cause a **variety of infections**, most commonly urinary tract, wound, and bloodstream infections, and pneumonia
- Often **resistant** to some antibiotics/antifungals often used for treatment of infection
- In **healthcare settings**, transmitted via **direct and indirect contact** with infected or colonized individuals or **contaminated healthcare environment**
- Are **emerging in prevalence** in the region

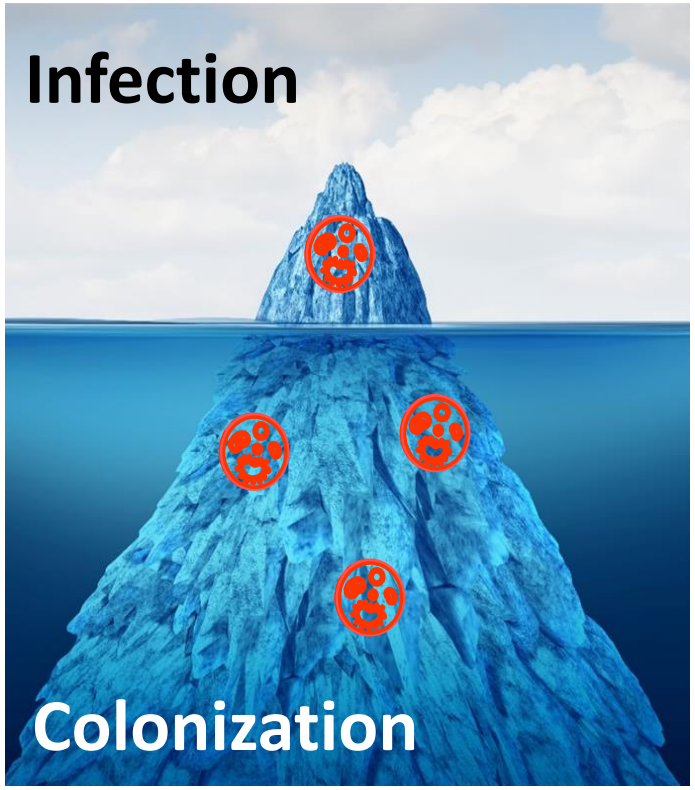
Colonization Drives MDRO Spread and Precedes Infection



Shedding of MDROs from colonized individuals leads to contamination of HCP hands and clothing and the surrounding healthcare environment



Colonization confers a 2-10 fold higher risk of infection with the colonizing organism

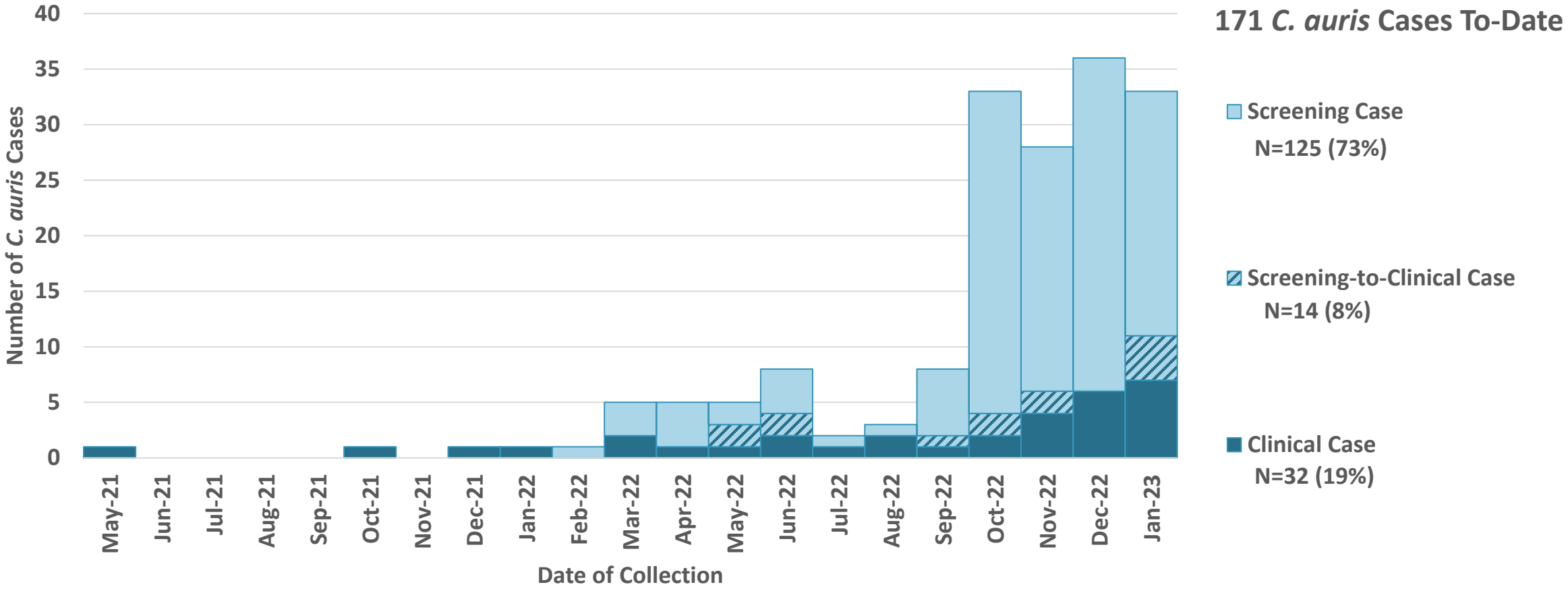


For every individual identified with an MDRO infection, there are some multiplier more who are colonized

Candida auris

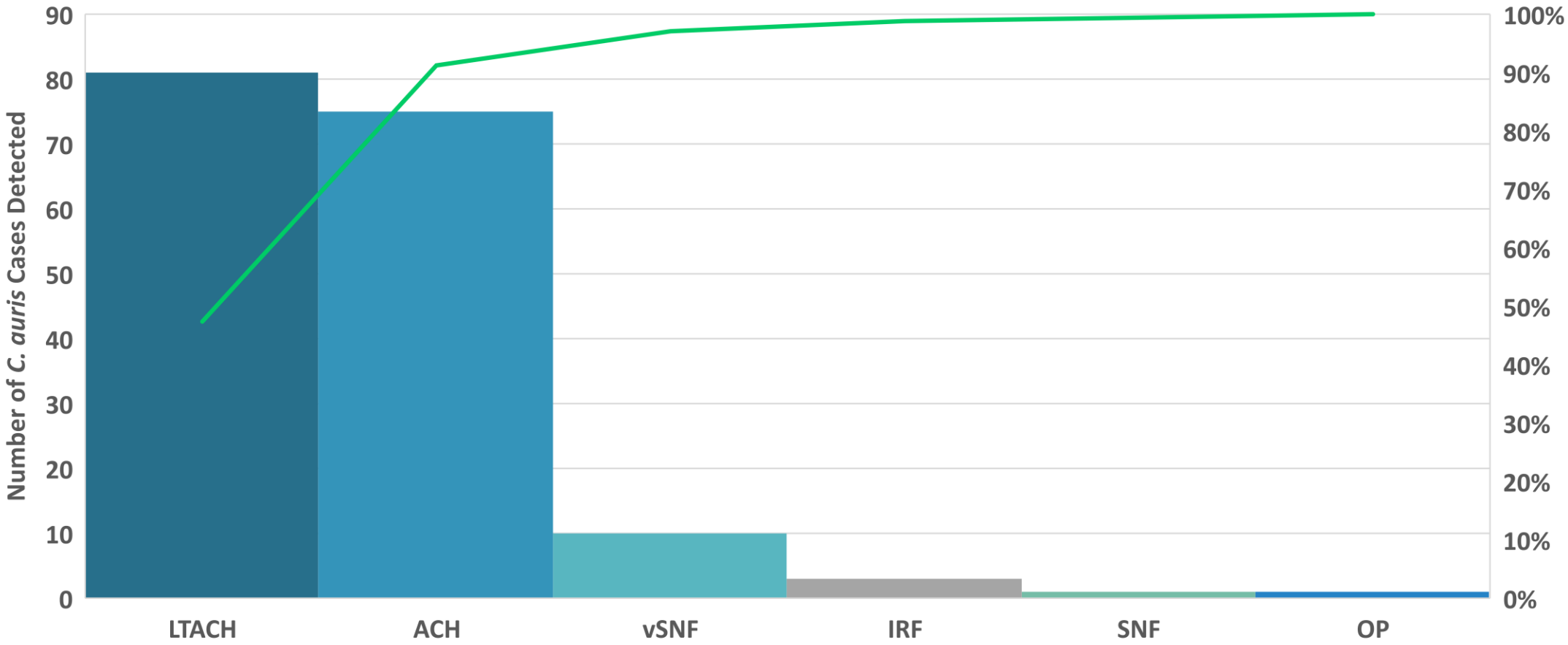
An emerging yeast MDRO

Candida auris Cases in Michigan



*Preliminary Data Available as of 1/24/23

Healthcare Facility Type at Case Detection



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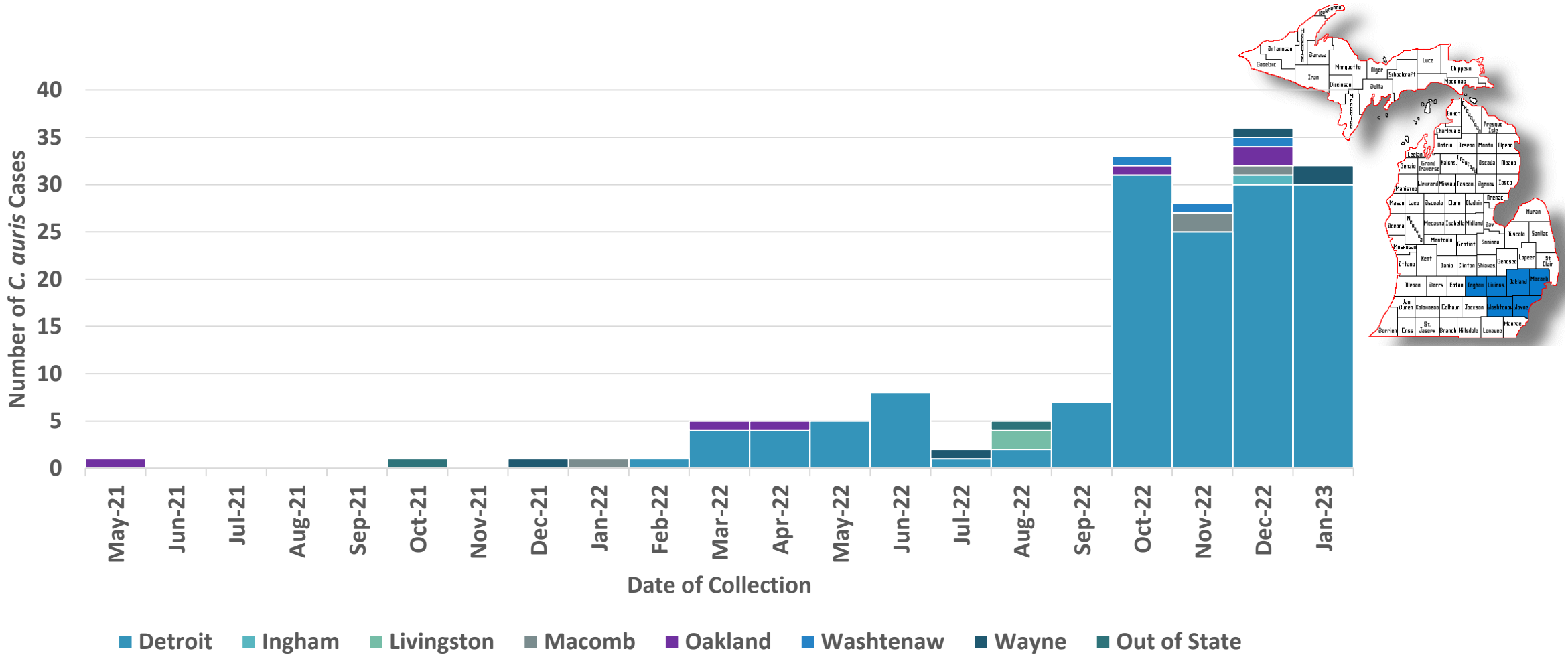
Local Health Jurisdiction of Healthcare Facility



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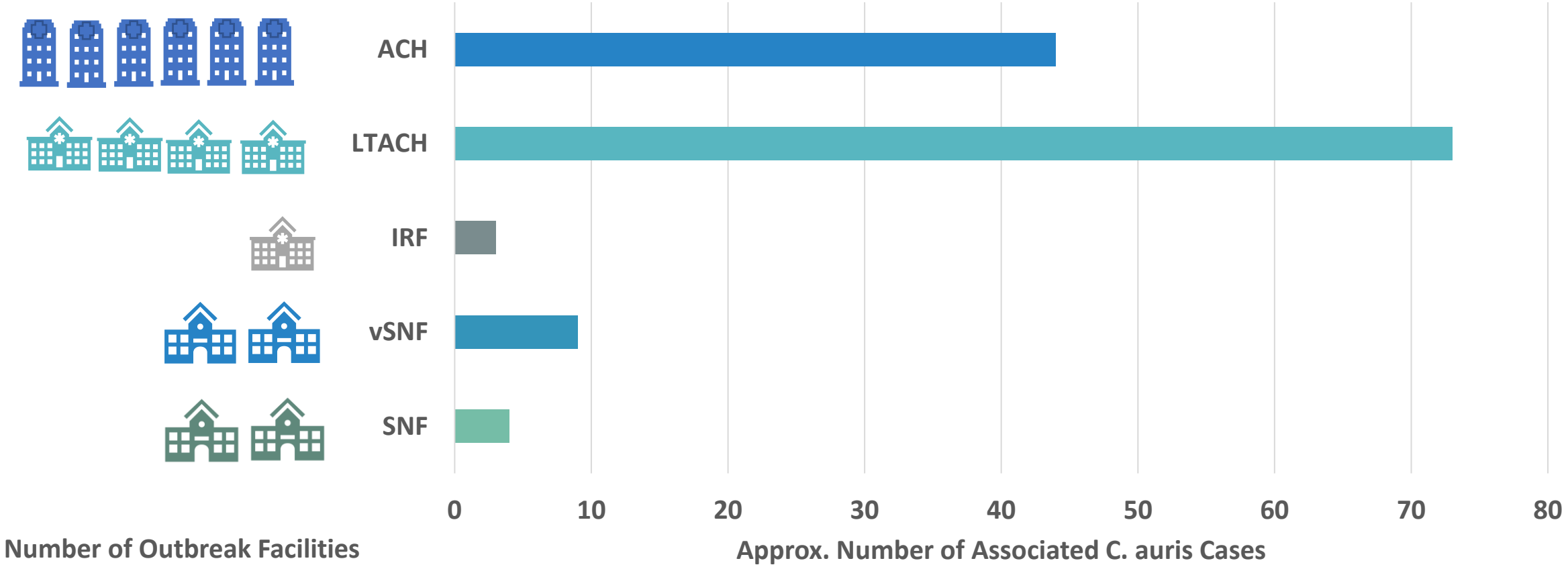
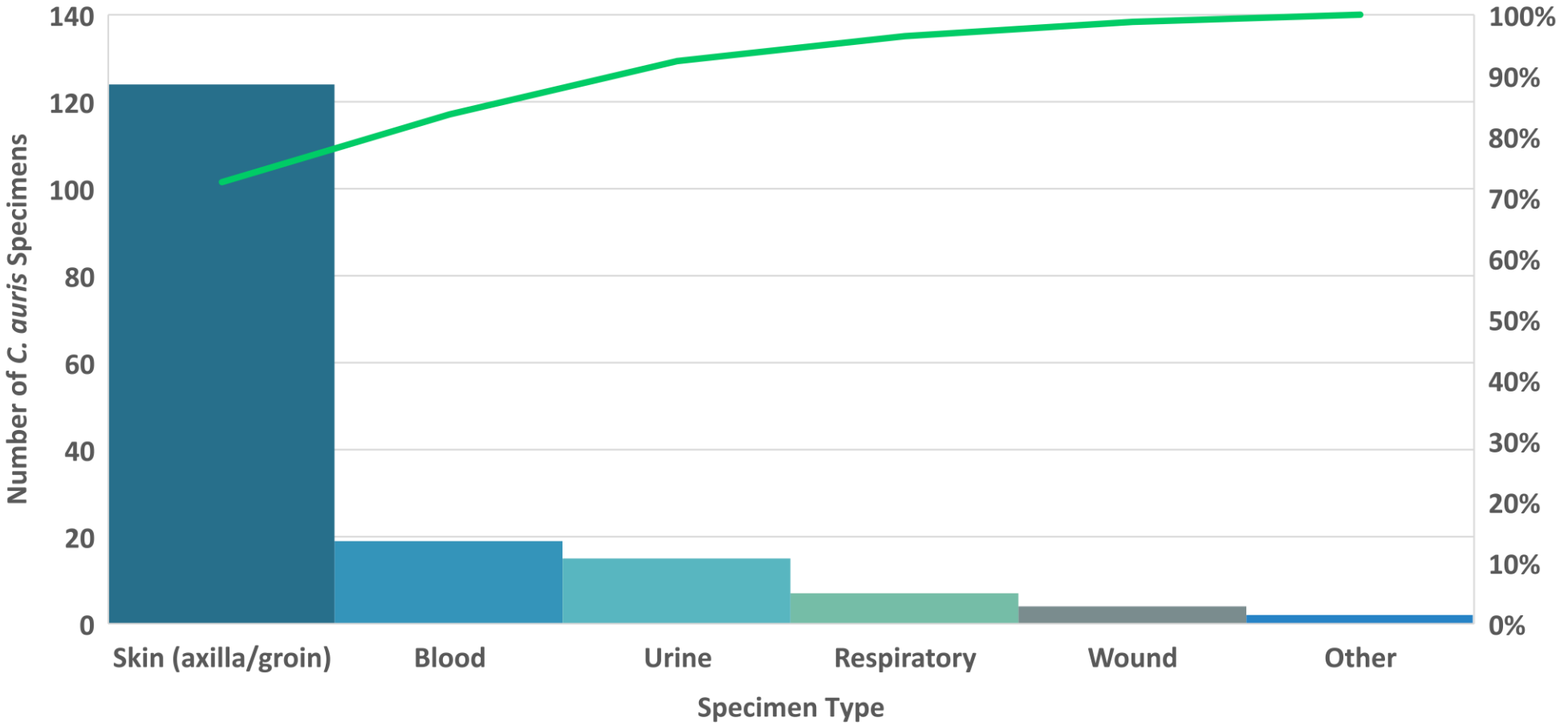
Candida auris Outbreaks‡ Detected



‡ Outbreak defined as ≥2 epi-linked cases

**Preliminary Data Available as of 1/16/23, Subject to Change*

Specimen Source of MI *Candida auris* Isolates



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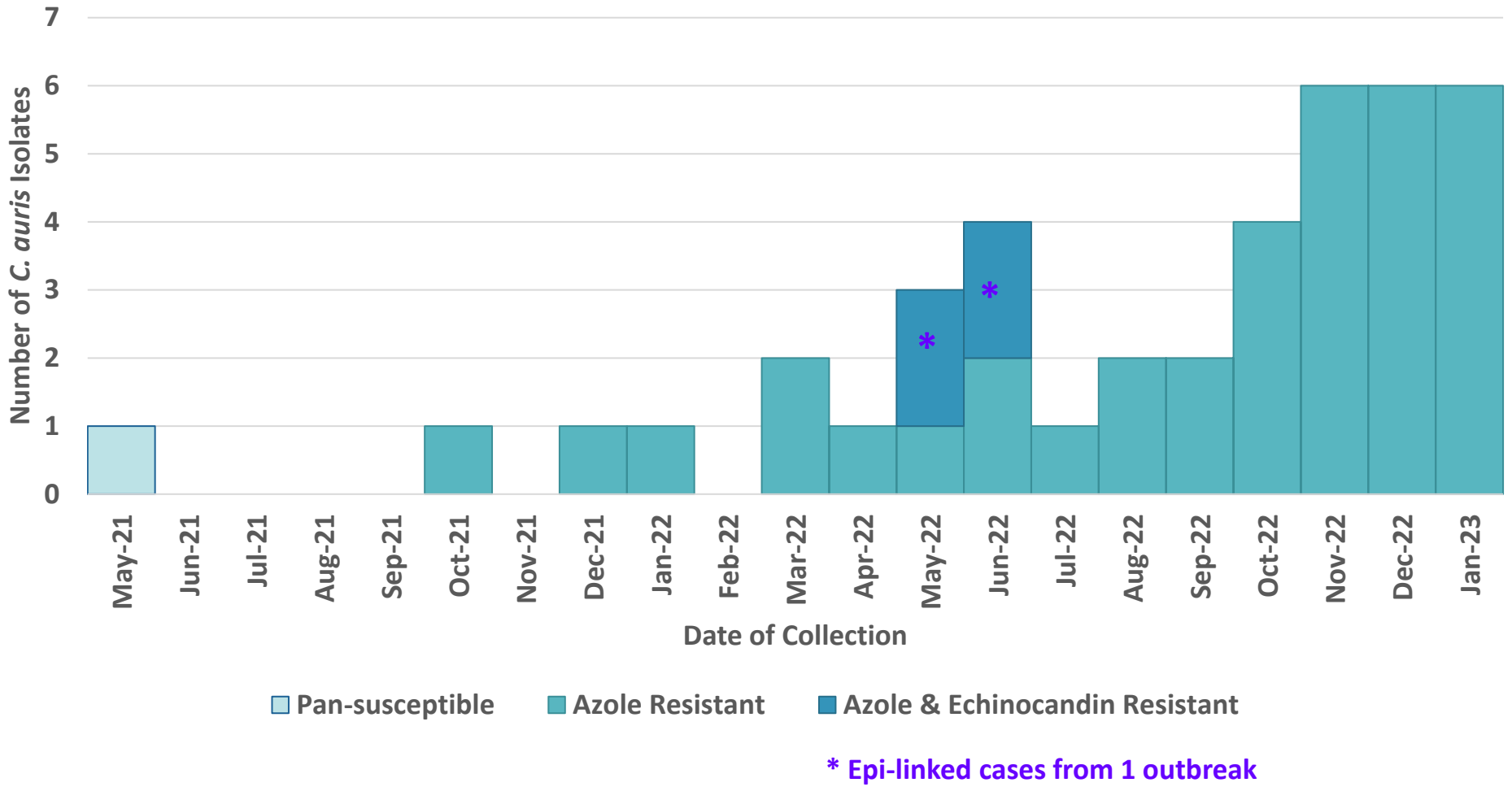
Clinical Isolate Antifungal Resistance

Azoles

Echinocandins

Polyenes



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Demographics & Common Risk Factors

Demographics

Age, Median 62 yrs (range 18->89)

Male Gender (50%)

Black/AA (51%)

Caucasian (19%)

Asian (1%)

Other (5%)

Unknown (23%)

Indwelling devices

Recent Mechanical Ventilation (68%)

Tracheostomy (61%)

PEG tube (66%)

CVC/PICC (38%)

Urinary Cath (43%)

Wounds

Chronic non-healing or surgical (60%)

HX MDROs

Hx MDROs (44%)

CRO (25%)

ESBL (20%)

MRSA (27%)

VRE (9%)

Comorbid conditions

Chronic Lung Disease

Diabetes

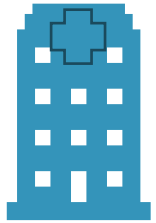
Renal Disease

Cardiovascular Disease

Cancer

**Preliminary Data Available as of 1/16/23, Subject to Change*

Multiple Healthcare Exposures are Common

Healthcare Setting	 Acute Care Hospital	 Long-term Acute Care Hospital	 Skilled Nursing Facility w/Ventilator Care	 Skilled Nursing Facility
At Time of Detection	43%	49%	6%	1%
Exposures in Last 90 Days	98%	52%	19%	17%

**Preliminary Data Available as of 1/16/23, Subject to Change*

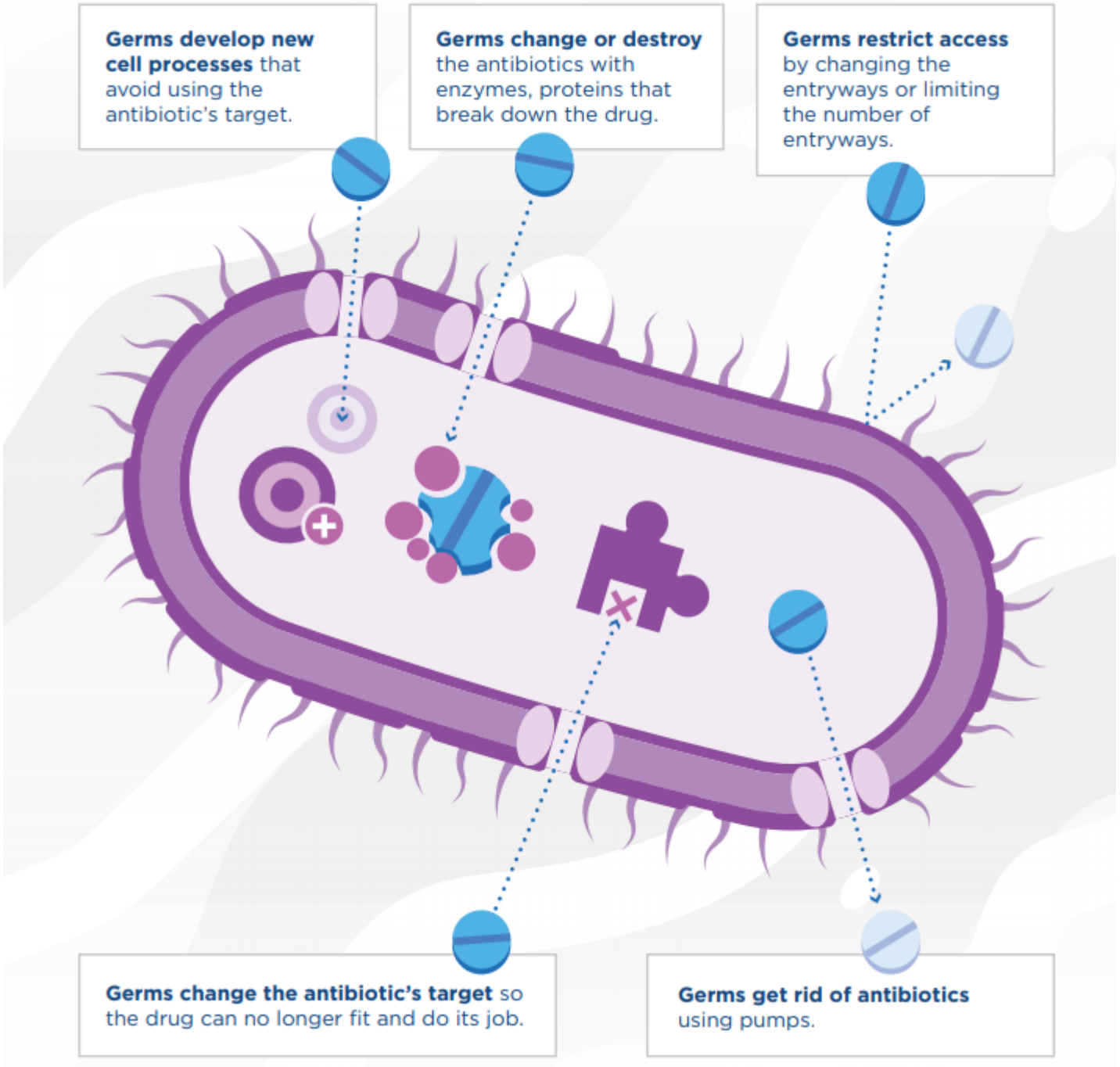
Carbapenemase-Producing Organisms

Emerging Enteric Bacteria

Mechanisms of Carbapenem Resistance

- Altered targets
- Avoidance of targets
- Porin loss
- Efflux pumps
- Enzymes

→ **Carbapenemases**



Carbapenemases Vary by Organism

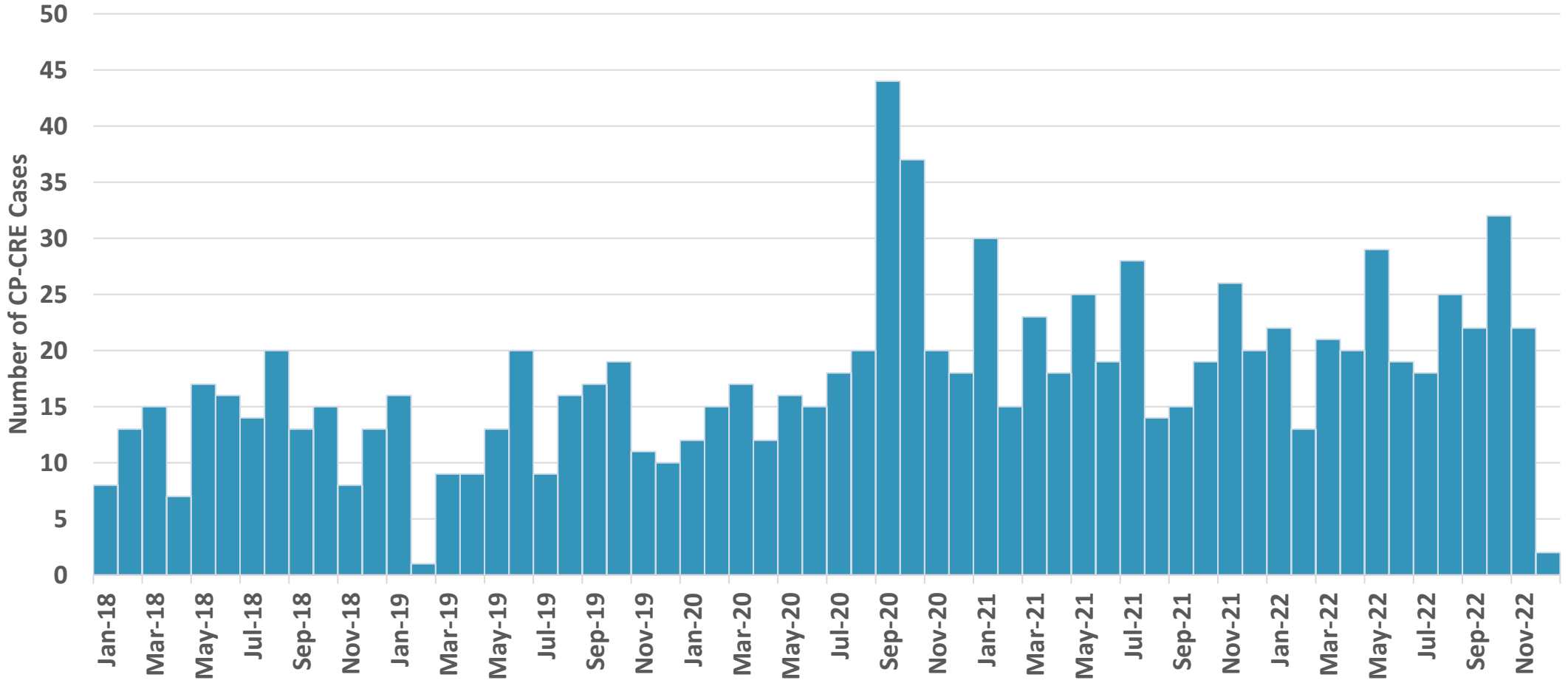
25-30% are CP	<5% are CP	>90% are CP

KPC, NDM, OXA-48-like, IMP, VIM

OXA-23, -24/40, 58, -235-like

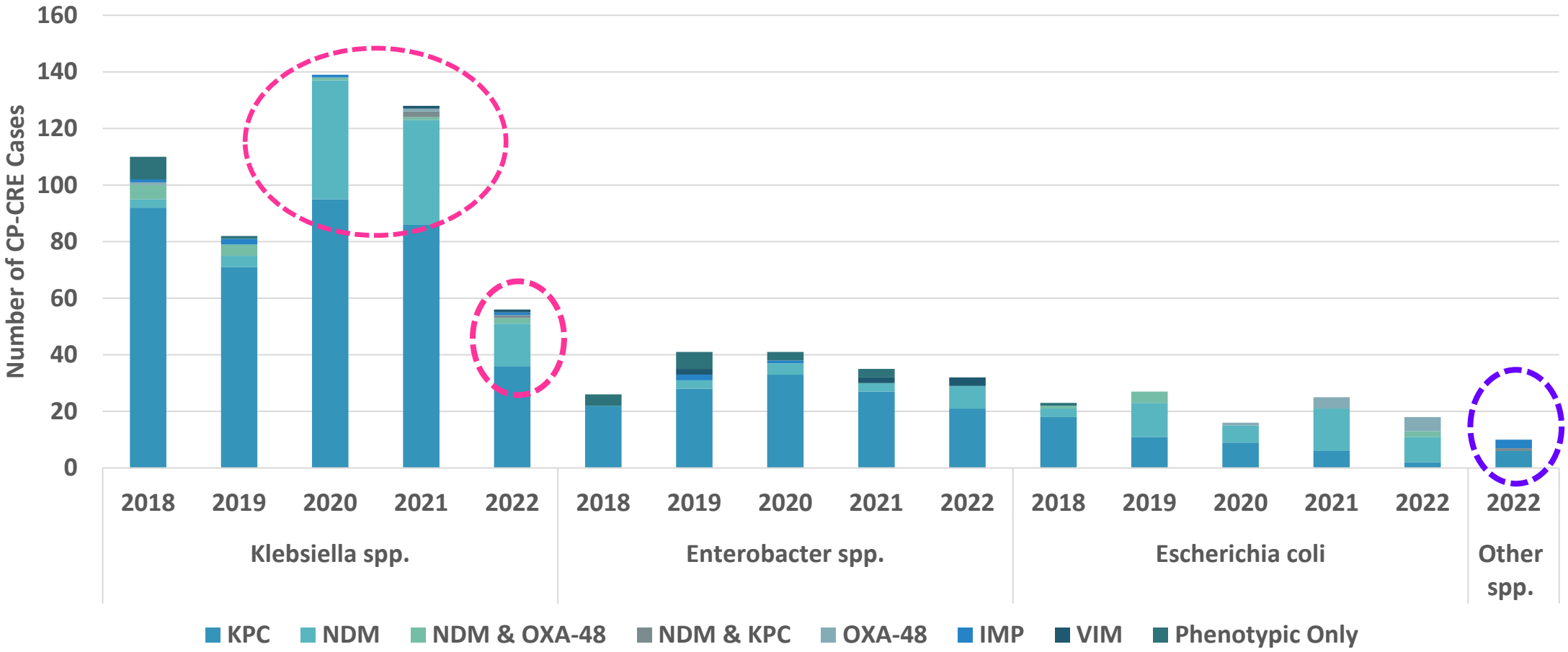
Confirmed CP-CRE Cases Reported to MDSS

2018-2022 YTD*



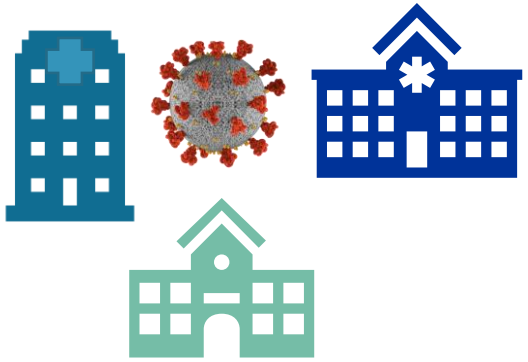
**Preliminary – Data Subject to Change*

Confirmed CP-CRE Cases Reported to MDSS
2018-2022Q3*

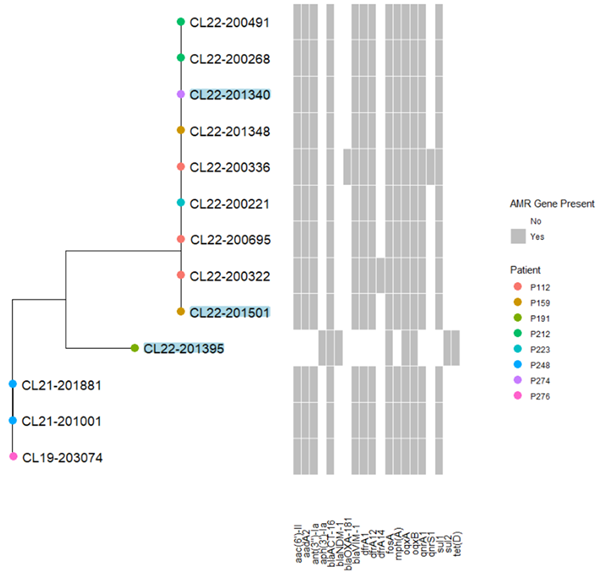


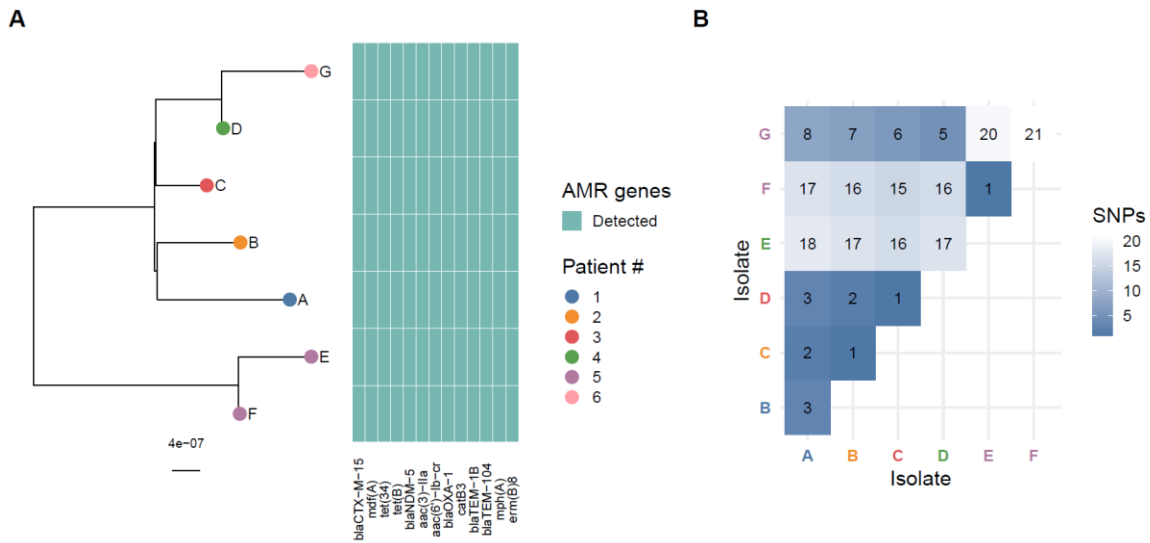
**Preliminary – Data Subject to Change*

More Recent CP-CRE Outbreaks Detected



E. Cloacae ST 114



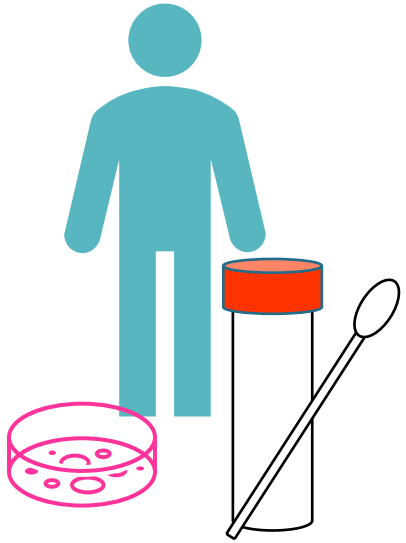


- Multiple outbreaks across settings
- Particularly in COVID-19 unit or during times of COVID-19 surges
- NDM *Klebsiella pneumoniae* ST 219 - >100 cases regionally (R2N, 2S)
- VIM *Enterobacter cloacae* ST 114 – 7 cases (R3)

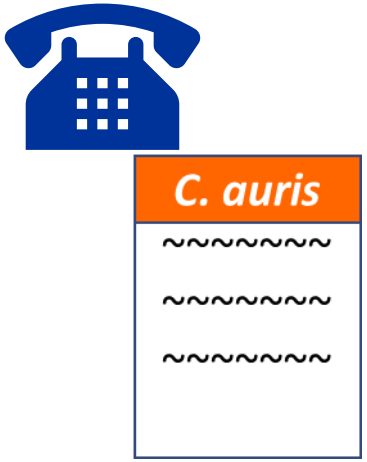
- Contaminated Duodenoscopes
- NDM *Escherichia coli* ST648

What Can Healthcare Facilities Do to Prevent Targeted MDROs?

Infection Prevention Practices



Identify Colonized and Infected Individuals



Communicate MDRO Status

Antibiotic & Antifungal Stewardship

Thank You

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